TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: 21900/0034

U.S. APPLICATION NO. (If known, see 37 CFR 1.5): 09/914449

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/JP99/07388	28 December 1999	

TITLE OF INVENTION

BEDSORE PREVENTING METHOD, BEDSORE PREVENTING SHEET, BEDSORE PREVENTING CLOTH, BEDSORE PREVENTING MATTRESS, BEDSORE PREVENTING BED, BEDSORE PREVENTING BED PAD, BEDSORE PREVENTING PRODUCT, AND METHOD FOR MANUFACTURING THE SAME

APPLICANT(S) FOR DO/EO/US

KANO, Hideyuki

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. § 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).

7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.

8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3).

9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).

10. ☐ A translation of the Annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.

12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

13. ☐ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.

14. ☐ A substitute specification.

15. ☐ A change of power of attorney and/or address letter

16. ☐ Other items or information:

JC03 Rec'd PCT/PTO 28 AUG 2001

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/914449	PCT/JP99/07388	21900/0034

☒ The following fees are submitted:

	CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)):		
Search Report has been prepared by the EPO or JPO.....**$860.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) **$690.00**		
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))**$710.00**		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....**$1,000.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4).....**$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	**$860.00**	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	**$0.00**	

Claims	Number Filed	Number Extra	Rate		
Total Claims	17 - 20 =	0	X **$18.00**	**$0.00**	
Independent Claims	12 - 3 =	9	X **$80.00**	**$720.00**	
Multiple dependent claim(s)(if applicable)			+ **$270.00**	**$0.00**	
TOTAL OF ABOVE CALCULATIONS =				**$1,580.00**	
Reduction by 1/2 for filing by small entity, if applicable.				**$790.00**	
SUBTOTAL =				**$0.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				**$0.00**	
TOTAL NATIONAL FEE =				**$790.00**	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				**$40.00**	
TOTAL FEES ENCLOSED =				**$830.00**	
				Amount to be: refunded	**$**
				charged	**$**

a. ☒ A check in the amount of $830.00 to cover the above fees is enclosed.
b. ☐ Please charge my Deposit Account No. **22-0185** in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.
c. ☒ The Director is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **22-0185**. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b) must be filed and granted to restore the application to pending status

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SPECIFICATION

BEDSORE PREVENTING METHOD, BEDSORE PREVENTING SHEET, BEDSORE PREVENTING CLOTH, BEDSORE PREVENTING MATTRESS, BEDSORE PREVENTING BED, BEDSORE PREVENTING BED PAD, BEDSORE PREVENTING PRODUCT, AND METHOD FOR MANUFACTURING THE SAME

TECHNICAL FIELD

The present invention relates to a method for preventing bedsore, which may occur to a bedridden elderly patient or an injured person, and also relates to bedsore preventing sheet, bedsore preventing cloth, bedsore preventing mattress, bedsore preventing bed, bedsore prevention bed pad, and bedsore preventing product, and also to a method for manufacturing these products.

BACKGROUND ART

When a bedridden elderly patient or a sick or injured person lies on mattress or on bed for long time, skin on back, shoulder, buttocks or backside of legs in contact with bedding materials such as mattress, bed, etc. becomes vulnerable or may be collapsed. This is generally called "bedsore". To

prevent the bedsore, a number of methods have been suggested and practiced in the past, such as the method to change the position of patient's body, to perform massage, to keep the patient's body clean, etc.

However, it is practically impossible to effectively prevent bedsore by the conventional methods as described above.

It is an object of the present invention to provide a bedsore preventing method for effectively preventing bedsore, a bedsore preventing product such as bedsore preventing sheet, bedsore preventing cloth, bedsore preventing mattress, bedsore preventing bed, and bedsore preventing bed pad, and also to provide a method for manufacturing these products.

DISCLOSURE OF THE INVENTION

In the past, it has been believed that bedsore is caused by poor blood circulation due to pressure on patient's body because of long-term contact with bedding materials. The present inventor has found that, when a patient has been lying for long time on bed, smelling components and harmful components are generated and stagnated around the patient's body,

and skin of the patient is eroded under the influence of these components and bedsore occurs. Then, it was found that bedsore can be prevented by effectively decomposing and eliminating these smelling components and harmful components. To attain the above object, the present invention provides a sheet made of nonwoven fabric or paper, and a deodorant also serving as an agent for removing harmful substances (hereinafter referred as "deodorant/agent") to be impregnated in the sheet and processed by graft polymerization. By arranging the sheet and the deodorant/agent on a portion of a patient's body in contact with a bedding material or on surface or inside of the bedding material, bedsore on the patient's body can be prevented.

Specifically, the present invention provides a method for preventing bedsore on body of a patient, comprising the step of:

arranging a bedsore preventing product on a portion of a bedridden patient's body in contact with bedding material or on surface or inside of the bedding material, whereby the bedsore preventing product comprises:

a sheet made of nonwoven fabric or paper; and

a deodorant also serving as an agent for removing harmful substances being impregnated in the sheet and processed by graft polymerization.

Further, the present invention provides a bedsore preventing sheet, which comprises a sheet made of nonwoven fabric or paper; and

a deodorant also serving as an agent for removing harmful substances being impregnated in the sheet and processed by graft polymerization.

Also, the present invention provides a bedsore preventing cloth, which comprises a sheet made of nonwoven fabric or paper; and

a deodorant also serving as an agent for removing harmful substances being impregnated in the sheet and processed by graft polymerization.

Further, the present invention provides a bedsore preventing mattress, which comprises a sheet made of nonwoven fabric or paper and used as surface material or used inside; and

a deodorant also serving as an agent for removing harmful substances being impregnated in the sheet and processed by graft polymerization.

Also, the present invention provides a bedsore preventing bed, which comprises a sheet made of nonwoven fabric or paper and used as a surface

material or used inside; and

a deodorant also serving as an agent for removing harmful substances being impregnated in the sheet and processed by graft polymerization.

Further, the present invention provides a bedsore preventing bed pad, which comprises a sheet made of nonwoven fabric or paper and used as a surface material or used inside; and

a deodorant also serving as an agent for removing harmful substances being impregnated in the sheet and processed by graft polymerization.

Also, the present invention provides a method for manufacturing bedsore preventing product, which comprises the steps of:

impregnating a sheet made of nonwoven fabric or paper with a deodorant also serving as an agent for removing harmful substances in liquid state;

drying the sheet thereafter; and

irradiating γ-ray to the sheet for graft polymerization before or after the drying step.

Further, the present invention provides a method for manufacturing bedsore preventing product, which comprises the steps of:

unwinding a sheet made of nonwoven fabric or paper from a roll of the sheet;

impregnating the unwound sheet with a deodorant also serving as an agent for removing harmful substances in liquid state;

drying the sheet thereafter;

irradiating γ-ray to the sheet for graft polymerization before or after the drying step; and

drying and winding up the sheet irradiated with the γ-ray, and forming a new roll.

Also, the present invention provides a method for manufacturing bedsore preventing product, the method comprising a process for manufacturing paper, said process comprising the steps of beating pulp used as raw material for paper, adding water, and making paper, wherein:

the method for manufacturing a bedsore preventing product comprises the step of intermingling a deodorant also serving as an agent for removing harmful substances processed by graft polymerization method and using pulp as a base material, and intermingling the deodorant also serving as an agent for removing harmful substances in the pulp.

Further, the present invention provides a bedsore preventing product, manufactured from a pulp used as raw material for paper and a deodorant also

serving as an agent for removing harmful substances and using pulp as base material.

Also, the present invention provides a method for preventing bedsore comprising the steps of;

impregnating threads with a deodorant also serving as an agent for removing harmful substances:

weaving a textile material from the threads after graft polymerization; and

arranging the bedsore preventing product made of the textile material on a portion of a patient's body in contact with a bedding material or on surface or inside of the bedding material for preventing and protecting the patient's body from bedsore.

Further, the present invention provides a bedsore preventing product, manufactured by impregnating threads with a deodorant also serving as an agent for removing harmful substances, and woven from the threads after graft polymerization.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematical plan view showing a preferred embodiment of a bedsore preventing sheet according to the present invention;

Fig. 2 is a plan view of the bedsore preventing

sheet of Fig. 1 placed between a mattress or a bed and a bed cloth;

Fig. 3 is a drawing to show an apparatus and a process (a first embodiment) for manufacturing a roll of a bedsore preventing sheet according to the present invention;

Fig. 4 is a flow chart showing a method (a second embodiment) for manufacturing a bedsore preventing sheet of the present invention from paper; and

Fig. 5 is a flow chart showing another method (a variation of the second embodiment) for manufacturing a bedsore preventing sheet of the present invention from paper.

In the figures, reference numeral 10 represents a bedsore preventing sheet, 12 a bed cloth, 20 a bedsore preventing sheet before cutting (a sheet before it is impregnated with a deodorant also serving as an agent for removing harmful substances), 20A and 20B each represents a roll, 22 - 38 each represents a roller, 40 and 42 each represents a sponge member, 46 represents a container, 48 a valve, 50 a liquid deodorant also serving as an agent for removing harmful substances, 52 is a heater, 54 hot air, 56 a γ-ray irradiating system, and 58 γ-ray.

BEST MODE FOR CARRYING OUT THE INVENTION

Description will be given below on preferred embodiments of the present invention referring to the drawings. Fig. 1 is a plan view schematically showing a bedsore preventing sheet 10 used for the prevention of bedsore according to the present invention. This bedsore preventing sheet 10 comprises nonwoven fabric or paper, and it is impregnated with a specific type of liquid and is then dried. The sheet made of nonwoven fabric or paper is impregnated with a specific type of liquid in order that it can provide deodorant effect and also an effect to remove harmful substances. This bedsore preventing sheet 10 is placed between a bed or a mattress and a bed cloth laid above the mattress.

Fig. 2 is a plan view schematically showing the bedsore preventing sheet 10 of Fig. 1 laid under the bed cloth 12. In case of a normal single size mattress or bed, the bedsore preventing sheet is about 80 - 90 cm in width and about 90 - 150 cm in length. The bedsore preventing sheet is simply laid between mattress or bed and bed cloth, while it may be fixed to bed cloth, mattress or bed using

adhesive tape.

Fig. 3 is a drawing to show a process for manufacturing the bedsore preventing sheet of Fig. 1. The bedsore preventing sheet of the present invention has been developed by the present inventor from a sheet for deodorizing also used for removing harmful substances. This deodorizing sheet has been already developed by the present inventor for the purpose of removing offensive smell in room or of eliminating harmful substances generated from new types of building materials. The sheet itself is the same as the deodorizing sheet for eliminating offensive smell and for removing harmful substances. This deodorizing sheet has been already developed and a patent application has been filed (Japanese Patent Application 11-217336). Fig. 3 shows a process of a first embodiment of a method for manufacturing a sheet for removing offensive smell and for eliminating harmful substances. Specifically, Fig. 3 shows an apparatus and a process for manufacturing a roll of sheet by irradiating γ-ray for graft polymerization to a sheet, which is impregnated with a "deodorant/agent" (i.e. a deodorant also serving as an agent for removing harmful substances). A sheet 20 is

unwound from a roll 20A of a sheet (nonwoven fabric or paper) before it is impregnated with a deodorant/agent, and the sheet 20 is moved by rollers 22 - 28 in a direction shown by an arrow M1. It is finally wound up, and a roll 20B is formed.

The roll 20B is rotated by a driving mechanism (not shown), and the rollers 22 - 28 are also partially rotated by a driving mechanism (not shown). In a container 46, a deodorant/agent in liquid state is held. When a valve 48 is opened, this deodorant/agent 50 is dropped down to a sponge member 42 under the container. Under the sponge member 42, another sponge member 40 is arranged to interpose the sheet 20 between the two sponge members. These two sponge members 40 and 42 are positioned face-to-face to each other and pushed under a predetermined pressure against each other by means of a mechanism (not shown).

These sponge members 40 and 42 are impregnated with the deodorant/agent 50 which is dropped down from the container 46. When the sheet 20 is moved between these sponge members, the deodorant/agent 50 in liquid state is impregnated into the sheet 20. The sheet 20 is carried in zigzag manner by a plurality of rollers 30 - 38, and this is to dry the

wet sheet 20 by hot air 54 which is sent from a heater 52. Before or after this drying process, γ-ray 58 generated by a γ-ray irradiating system 56 is irradiated to the sheet 20. In the figure, γ-ray is irradiated after the drying process. By the irradiation of this γ-ray, graft polymerization occurs on the impregnated deodorant/agent 50. Carrying speed and winding speed are controlled in such manner that the sheet is wound up as a roll 20B after the drying process has been completed.

As the deodorant/agent 50 in liquid state, a deodorant/agent for graft polymerization is used. The deodorant/agent for graft polymerization has a graft chain, to which a functional group is introduced. As the functional group, a cation exchange group or a sulfonic acid group and a carboxylic group may be used. A deodorant using the cation exchange group is described in Japanese Patent Publication 7-79593. More concretely, it is a molded product comprising a base material of pulp and/or polyolefin and having a cation exchange group. To produce the cation type deodorant, a reactive monomer is combined with the molded product by graft polymerization. A deodorant using the sulfonic acid group and the carboxylic group is described in

an article titled "Performance Evaluation of Deodorant using Pulp Ball as Base Material" in "Kankyo Gijutsu (Environmental Technique)", Vol. 22, No.5, 1993, pp.22-25). By graft polymerization method under simultaneous γ-ray irradiation, sulfonic acid group and carboxylic group are introduced into cellulose type pulp ball.

These graft-polymerized deodorant/agent induces chemical reaction with substances causing offensive smell and harmful substances, and it turns these substances to odorless and harmless substances. The deodorizing principle is different from that of activated carbon powder or granular activated carbon, which physically adsorbs the substances causing offensive smell. Therefore, the graft-polymerized deodorant/agent is not engaged in further reaction after the chemical reaction with a predetermined quantity of bad-smelling substances. In this sense, it is different from activated carbon, which adsorbs a certain quantity of bad-smelling substances and it is then saturated and releases the adsorbed smelling substances. The time required for inducing the chemical reaction with a certain quantity of smelling substances varies according to quality and quantity of the smelling substances, and it is not

always the same. In a normal type house, the effects of chemical reaction last for a period of about 3 - 6 months. Harmful substances such as formaldehyde, toluene, xylene, wood preservative, plasticizer, agent for preventing and killing ant, etc. can be almost completely eliminated within a period from several days to several weeks.

In the process for manufacturing the sheet shown in Fig. 3, the sheet 20 is already manufactured in advance, and deodorant effect is added to it. On the other hand, it is also possible to add the effects to deodorize and to remove harmful substances in the process to manufacture the sheet from paper. Fig. 4 is a flow chart showing a second embodiment of a method for manufacturing the sheet for deodorizing and removing harmful substances of the present invention.

In Step S1, a raw material pulp is charged. In this case, another type of solid raw material is added in addition to the pulp i.e. the normal raw material for paper. This solid raw material comprises a pulp added with a deodorant/agent manufactured by graft polymerization method. These two types of raw materials are agitated in Step S2. Then, as in the normal paper manufacturing process,

paper is manufactured through the processes of beating (Step S3), water-adding (Step S4), additional beating (Step S5), paper-making (Step S6), and drying (Step S7).

In the flow chart shown in Fig. 4, the deodorant/agent manufactured by graft polymerization and using pulp as base material is mixed with the initial raw material in the stage of raw material charging (Step S1). In case the deodorant/agent manufactured by graft polymerization method and using pulp as base material is fiber material already cut into fine pieces, it may be intermingled with the initial raw material between the Steps S3 and S4 in the flow chart of Fig. 4.

Specifically, Fig. 5 represents a variation of the flow shown in Fig. 4. In Step S1A, a first raw material, i.e. a pulp used as the initial raw material for paper, is charged. After the process of beating (Step S3), a second raw material, i.e. a deodorant/agent manufactured by graft polymerization and using pulp as a base material, is charged (Step S1B). Thereafter, paper is manufactured as in the flow chart of Fig. 4 through the processes of agitation (Step S2), water-adding (Step S4), additional beating (Step S5), paper-making (Step S6),

and drying (Step S7).

The deodorant/agent manufactured by graft polymerization method and using pulp as base material is intermingled with the initial raw material at a predetermined ratio. If several tens of grams of the deodorant/agent is intermingled with the initial raw material per one square meter of the finished paper, deodorant effect and effect for removing harmful substances suitable for practical use can be provided. In particular, the chemical action of the deodorant/agent manufactured by graft polymerization method and using pulp as base material, i.e. the effects for deodorizing and for removing harmful substances, do not change even when it is cut to fine pieces, and the effects can be provided even when it is intermingled with the raw material pulp. The method shown in Fig. 4 and Fig. 5 is different from the method shown in Fig. 3 in that the paper is manufactured from the first stage. If the finished products are compared, the manufacturing cost is lower in the products manufactured by the methods of Fig. 4 and Fig. 5.

The sheet of the present invention produced by the methods shown in Fig. 3 to Fig. 5 is laid under bed cloth as bedsore preventing sheet as shown in

Fig. 1. In addition, it can be further processed and may be used as a bed cloth, or it may be used as a textile material for mattress, bed or bed pad, or a lining material of these products.

In the embodiment described above, explanation has been given on sheet-like bedsore preventing products made of nonwoven fabric or paper, while textile material may be used as the sheet instead of nonwoven fabric. In case of cloth or textile material, it is more efficient in the manufacturing process to impregnate it with the deodorant/agent in the state of threads before weaving, and graft polymerization is performed instead of impregnating it with the deodorant/agent after it has been woven as cloth or textile. To perform graft polymerization by impregnating the threads with the deodorant/agent, the same method as the method explained in connection with Fig. 3 may be applied.

INDUSTRIAL APPLICABILITY

As described above, according to the present invention, a sheet made of nonwoven fabric or paper is impregnated with a deodorant also serving as an agent for removing harmful substances in liquid state, and γ-ray is irradiated for graft

polymerization. As a result, the duration of the deodorant effect and the effect for removing harmful substances is very long. When it is applied for bedding materials, smelling components and harmful substances near a bedridden patient's body can be effectively removed, and bedsore caused by these substances can be effectively prevented. When paper is manufactured, the deodorant/agent manufactured by graft polymerization method and using pulp as base material is intermingled in the raw material pulp, and it is possible to extend the duration of the deodorant effect and the effect for removing harmful substances. When this is applied as bedding materials, the same effect can be provided at lower cost. Further, the threads before weaving textile material may be impregnated with the deodorant/agent. For graft polymerization, γ-ray is irradiated, and similar effects can be provided when the textile material made of such treads is used.

WHAT IS CLAIMED IS:

1. A method for preventing bedsore on body of a patient, comprising the step of:

arranging a bedsore preventing product on a surface portion of a patient's body in contact with a bedding material or on surface or inside of said bedding material, whereby said bedsore preventing product comprises:

a sheet made of nonwoven fabric or paper; and

a deodorant also serving as an agent for removing harmful substances being impregnated in said sheet and processed by graft polymerization.

2. A bedsore preventing sheet, comprising:

a sheet made of nonwoven fabric or paper; and

a deodorant also serving as an agent for removing harmful substances being impregnated in said sheet and processed by graft polymerization.

3. A bedsore preventing sheet according to claim 2, wherein said graft-polymerized deodorant also serving as an agent for removing harmful substances has a graft chain where a functional group is introduced, and a cation exchange group or a sulfonic acid group and a carboxylic group are

used as the functional group.

4. A bedsore preventing cloth, comprising:

a sheet made of nonwoven fabric or paper; and

a deodorant also serving as an agent for removing harmful substances being impregnated in said sheet and processed by graft polymerization.

5. A bedsore preventing cloth according to claim 4, wherein said graft-polymerized deodorant also serving as an agent for removing harmful substances has a graft chain where a functional group is introduced, and a cation exchange group or a sulfonic acid group and a carboxylic group are used as the functional group.

6. A bedsore preventing mattress comprising:

a sheet made of nonwoven fabric or paper and used as surface material or used inside; and

a deodorant also serving as an agent for removing harmful substances being impregnated in said sheet and processed by graft polymerization.

7. A bedsore preventing mattress according to claim 6, wherein said graft-polymerized deodorant

also serving as an agent for removing harmful substances has a graft chain where a functional group is introduced, and a cation exchange group or a sulfonic acid group and a carboxylic group are used as the functional group.

8. A bedsore preventing bed, comprising:

a sheet made of nonwoven fabric or paper and used as a surface material or used inside; and

a deodorant also serving as an agent for removing harmful substances being impregnated in said sheet and processed by graft polymerization.

9. A bedsore preventing bed according to claim 8, wherein said graft-polymerized deodorant also serving as an agent for removing harmful substances has a graft chain where a functional group is introduced, and a cation exchange group or a sulfonic acid group and a carboxylic group are used as the functional group.

10. A bedsore preventing bed pad, comprising:

a sheet made of nonwoven fabric or paper and used as a surface material or used inside; and

a deodorant also serving as an agent for

removing harmful substances being impregnated in said sheet and processed by graft polymerization.

11. A bedsore preventing bed pad according to claim 10, wherein said graft-polymerized deodorant also serving as an agent for removing harmful substances has a graft chain where a functional group is introduced, and a cation exchange group or a sulfonic acid group and a carboxylic group are used as the functional group.

12. A method for manufacturing a bedsore preventing product, comprising the steps of:

impregnating a sheet made of nonwoven fabric or paper with a deodorant also serving as an agent for removing harmful substances in liquid state;

drying said sheet thereafter; and

irradiating γ-ray to said sheet for graft polymerization before or after said drying step.

13. A method for manufacturing a bedsore preventing product, comprising the steps of:

unwinding a sheet made of nonwoven fabric or paper from a roll of said sheet;

impregnating said unwound sheet with a deodorant

also serving as an agent for removing harmful substances in liquid state;

drying said sheet thereafter;

irradiating γ-ray to said sheet for graft polymerization before or after said drying step; and

drying and winding up said sheet irradiated with said γ-ray, and forming a new roll.

14. A method for manufacturing a bedsore preventing product, said method comprising a process for manufacturing paper, said process comprising the steps of beating pulp used as raw material for paper, adding water, and making paper, wherein:

said method for manufacturing a bedsore preventing product comprises the step of intermingling a deodorant also serving as an agent for removing harmful substances processed by graft polymerization method and using pulp as a base material, and intermingling said deodorant also serving as an agent for removing harmful substances in said pulp.

15. A bedsore preventing product, manufactured from a pulp used as raw material for paper and a deodorant also serving as an agent for removing

harmful substances and using pulp as a base material.

16. A method for preventing bedsore, comprising the steps of:

impregnating threads with a deodorant also serving as an agent for removing harmful substances;

weaving a textile material from said threads after graft polymerization; and

arranging said bedsore preventing product made of said textile material on a portion of a patient's body in contact with a bedding material or on surface or inside of said bedding material for preventing and protecting the patient's body from bedsore.

17. A bedsore preventing product, manufactured by impregnating threads with a deodorant also serving as an agent for removing harmful substances, and woven from said threads after graft polymerization.

ABSTRACT

The object of the present invention is to provide a bedsore preventing method for effectively preventing bedsore of patients, and a bedsore preventing product such as bedsore preventing sheet, bedsore preventing cloth, bedsore preventing mattress, bedsore preventing bed, and bedsore preventing bed pad, and also to provide a method for manufacturing these products. Bedsore is prevented by effectively decomposing and removing smelling components and harmful components. For this purpose, the bedsore preventing product comprises a sheet 10 made of nonwoven fabric or paper and a deodorant also serving as an agent for removing harmful substances processed by graft polymerization. By arranging the bedsore preventing product on a portion of a patient's body in contact with a bedding material or on surface or inside of the bedding material, bedsore on the patient's body can be prevented.

FIG. 1

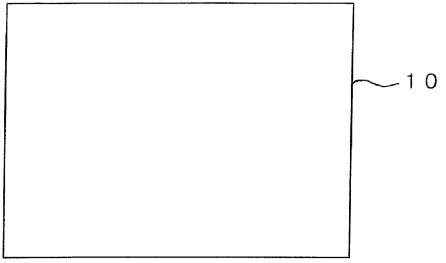


FIG. 2

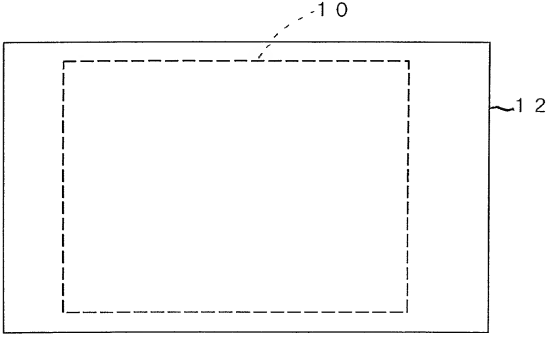


FIG. 3

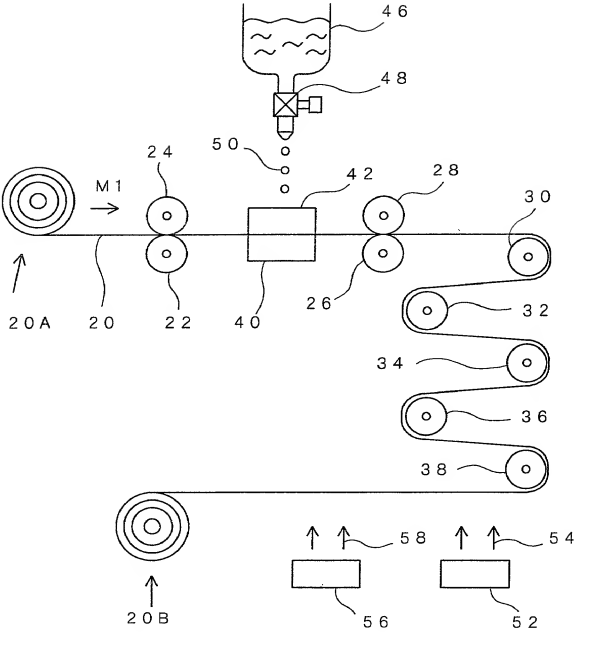


FIG. 4

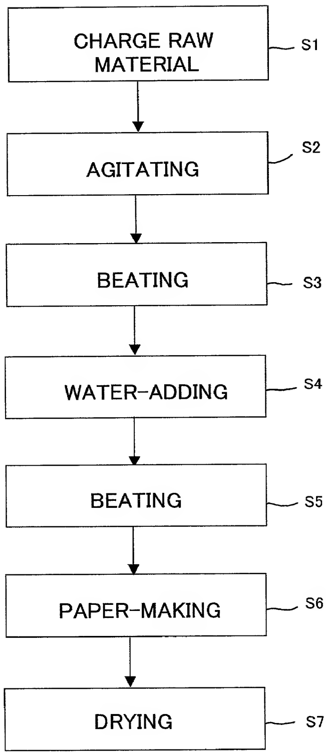
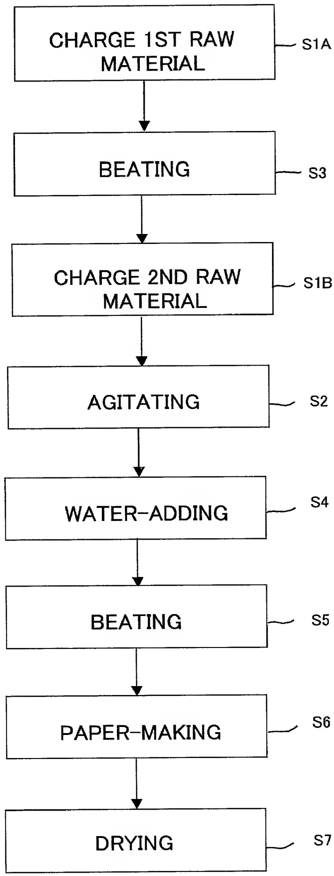


FIG. 5


CHARGE 1ST RAW MATERIAL
S1A
BEATING
S3
CHARGE 2ND RAW MATERIAL
S1B
AGITATING
S2
WATER-ADDING
S4
BEATING
S5
PAPER-MAKING
S6
DRYING
S7

DECLARATION FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: BEDSORE PREVENTING METHOD, BED PREVENTING SHEET, BEDSORE PREVENTING CLOTH, BEDSORE PREVENTING MATTRESS, BEDSORE PREVENTING BED, BEDSORE PREVENTING BED PAD, BEDSORE PREVENTING PRODUCT, AND METHOD FOR MANUFACTURING THE SAME

the specification of which: (check one)

[ ] is attached hereto.

[X] was filed on Dec. 28 1999, as United States Patent Application Serial No. or PCT International Application Number _____, and was amended on _____ 19__ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with 37 CFR § 1.56(a).

Prior Foreign Application(s): I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate listed below, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

(Application No.)	(Country)	(Day/Month/Year Filed)	Priority Claimed [ ] [ ] Yes No
(Application No.)	(Country)	(Day/Month/Year Filed)	[ ] [ ] Yes No
(Application No.)	(Country)	(Day/Month/Year Filed)	[ ] [ ] Yes No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

Application No.	Filing Date

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by 35 U.S.C. § 112, first paragraph, I acknowledge the duty to disclose material information as defined in 37 CFR § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(U.S. Application Serial No.)	(U.S. Filing Date)	(Status--patented, pending, abandoned)
(U.S. Application Serial No.)	(U.S. Filing Date)	(Status--patented, pending, abandoned)

(12)

I hereby appoint Elliott I. Pollock, Registration No. 16,906; George Vande Sande, Registration No. 17,276; Burton A. Amernick, Registration No. 24,852; Stanley B. Green, Registration No. 24,351; Richard Wiener, Registration No. 18,741; Townsend M. Belser, Jr., Registration No. 22,956; Morris Liss, Registration No. 24,510; Martin Abramson, Registration No. 25,787; George R. Pettit, Registration No. 27,369; Elzbieta Chlopecka, Registration No. 32,767; Eric J. Franklin, Registration No. 37,134; and Jeffri A. Kaminski, Reg. No. 42,709, my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(100)

Full name of sole or first inventor: Hideyuki Kano

Inventor's Signature Hideyuki Kano Date March 5, 2001

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[ ] See next page for additional inventors